

Appl. No. 10/754,521
Reply to Office action of 04/20/2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-13 (canceled).

14. (Original) A method of performing a liner change from an operating heated semiconductor furnace, comprising:

removing a heated liner from the operating heated furnace with a fixture; and
inserting a replacement liner into the operating heated furnace.

15. (Original) The method as specified in Claim 14 wherein the furnace is a vertical-type furnace.

16. (Original) The method as specified in Claim 14 wherein the furnace is a vertical nitride furnace.

17. (Original) The method as specified in Claim 15 wherein the liner is removed at a rate below a first maximum threshold rate to control a rate of temperature decrease of the liner when removed from the operating furnace.

18. (Original) The method as specified in Claim 17 wherein the first maximum threshold rate is 50mm/min.

19. (Original) The method as specified in Claim 15 wherein the furnace is operating at a temperature of at least 500 °C.

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20. (Original) The method as specified in Claim 15 wherein the replacement liner is inserted into the furnace at a rate below a second maximum threshold rate to control a rate of temperature increase of the liner when inserted into the operating furnace.

21. (Original) The method as specified in Claim 20 wherein the second maximum threshold rate is 50 mm/min.

22. (Currently amended) ~~The method as specified in Claim 14~~ A method of performing a liner change from an operating heated semiconductor furnace, comprising:

removing a heated liner from the operating heated furnace with a fixture by:

supporting the heated liner with a first ring and a second ring of said fixture, wherein the second ring is coupled to the first ring;

rotating the second ring between a locked position when the liner is elevated into the operating furnace and an unlocked position when the liner is lowered from the operating furnace; and

during said rotating step, facilitating the rotation of said second ring using a low-friction member interfaced between the first ring and the second ring;

inserting a replacement liner into the operating heated furnace wherein the method is performed using a fixture comprising:

a first ring;

a second ring coupled to the first ring and adapted to support the liner when elevated into the operating furnace, and when the liner is removed from the furnace, the second ring having structure adapted to rotate the second ring between a locked position when the liner is elevated into the operating furnace and an unlocked position when the liner is lowered from the operating furnace; and

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~~_____ a low friction member interfaced between the first ring and the second ring facilitating the rotation of the second ring with respect to the first ring when the second ring is both heated proximate the furnace and when lowered from the furnace.~~

23. (Currently amended) The ~~fixture~~ method as specified in Claim 22 wherein the first ring is an outer ring, and the second ring is an inner ring.

24. (Currently amended) The ~~fixture~~ method as specified in Claim 23 wherein the inner ring at least partially resides in the outer ring.

25. (Original) The method as specified in Claim 22 further comprising the step of using an elevator adapted to support the first ring and elevate the liner into the operating furnace, and lower the liner from the operating furnace.

26. (Original) The method as specified in Claim 25 wherein the second ring further comprises at least one radially extending handle adapted to facilitate rotation of the second ring with respect to the first ring along the low-friction member.

27. (Original) The method as specified in Claim 26 wherein the handles have at least two securing points coupling the handles to the second ring, the two securing points being separated a predetermined arcuate distance.

28. (Original) The method as specified in Claim 27 wherein the handles each have a lever point radially separated from the second ring along an axis extending between the two securing points to form a "T" relationship relative to the two securing points.

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29. (Original) The method as specified in Claim 28 wherein the two securing points are separated an arcuate distance of at least 14 degrees.

30. (Original) The method as specified in Claim 22 wherein the low-friction member has a flanged rim extending over the first ring.

31. (Original) The method as specified in Claim 25 wherein the elevator lowers the liner from the heated operating furnace at a rate below a predetermined maximum rate to control the rate of temperature change of the hot liner when removed from the heated furnace.

32. (Original) The method as specified in Claim 25 wherein the elevator elevates the liner into the heated operating furnace at a rate below a predetermined maximum rate to control the rate of temperature change of the liner when inserted into the heated furnace.

33. (Original) The method as specified in Claim 25 wherein the predetermined maximum rate is 50mm/min.

34. (Original) The method as specified in Claim 25 wherein the predetermined maximum rate is 50mm/min.